

Committee Activity Report CIE TC 2-39 Geometric Tolerances for Color Measurement

Terms of Reference

Compile a technical report and recommendations specifying the geometric tolerances for the various geometries in colorimetry, including 0/45, 0/d and others. Parts of this technical report may be suitable for inclusion in a CIE standard specifying several geometric tolerance levels.

Working Program

Utilize ISO 5/1 and ASTM E 1767 to develop a system of specifications for the geometry of color measurements. Define the specifications in the following order: Reflectance factor (t/8, d/8, d/0), radiance factor (45/0) and transmittance geometries (0/0, d/0). Specifications will be developed via computer simulation & verified experimentally.

Current Committee Membership:

A Bittar (New Zealand), J. Taylor (United Kingdom), E. Early (USA), L. Hanssen (USA), G. Baba (Japan), B. Jordon (Canada), J. Zwinkels (Canada), W. Czepluch (Germany), N. Johnson (USA), D. Rich (USA), Chairman, R. Fisch (USA), J. Pietrzykowski (Poland), A. Kravetz (USA), J. Ladson (USA), J. Decarreau (France)
Consulting Member: W. Erb (Germany)

Status

The Committee met at the Town & Country Hotel in San Diego, USA on 1 July of 2003 and reviewed its progress. Six members and ten guests were present. Two new drafts of the committee report have been circulated since the last meeting in May, 2001. At a CORM meeting and the CORM / NPL Oxford Conference in the USA member E. Early made a proposal to utilize a new method of specifying the geometry of an instrument based on the formalism of geometric lens design programs. While the proposal appears to have merit, it is too recent for optical engineers and metrologists to have tested and compared it to existing instrument performance so that tolerances on an instrument design may be defined in the prescriptive notation. Draft 6 included the main parts of the Early proposal in an Annex so that readers of the report might have the opportunity to develop the required comparisons.

Draft 5 of the committee report received many useful comments from the committee and all were implemented. The revised report was distributed again, as Draft 6 and received a comment from member G. Baba and several comments from a guest, K. Imura of Minolta, Japan. In the Baba comment, it was suggested that the term, "level" used to describe the degree of conformance of an instrument to the specifications be changed to the term, "category". This is a good

suggestion and will be implemented in the final report. He also supplied an additional reference to some of the data which he had supplied to the committee.

The following issues were raised during the meeting in San Diego:

1. J. Zwinkels commented that she is still uncomfortable with the specification and tolerances on integrating spheres. She volunteered to supply an alternative specification and some editorial comments. Several other attendees agreed with her on the issue of sphere efficiency.
2. B. Jordan suggested that the reference to Helmholtz reciprocity be changed to reflect that its validity has been challenged in the literature and may not hold if certain, non-geometric attributes of the measurements are not taken into account.
3. There was a suggestion to include a description of the various approaches that might be used to test or verify the level of uniformity across the sampling aperture. Several attendees volunteered to send suggestions for inclusion.
4. J. Zwinkels suggested consulting a publication by Clarke and Compton. She will supply a reference to the Chairman.
5. E. Early suggested that the functional notation be re-ordered so that the centroid angle occurs first in the series of Influx or Efflux.
6. It was suggested that the title of section 2.2 be changed from specifying "colorimeters" to specifying "color measurements".
7. N. Johnson suggested that an informative Annex be included which contains example specifications for each geometry.

Based on the comments of the committee members at this meeting and comments from guests, a 7th draft will be required. The chairman will solicit the information volunteered by the attendees and issue a new draft by the fall. If the volunteered information is not received by September, the draft will be revised as best as possible and distributed along with a ballot, assuming that the issue was not as important or tractable as stated at the meeting. It is hoped that the final report can be distributed to the Division directors for approval by the end of 2003.